Professional Development (Learning and Teaching)

ACTIVE LEARNING STRATEGIES

UNIVERSITY OF WOLLONGONG AUSTRALIA

This resource has sections on activities for individuals and activities for groups, as well as a section on how to best use questioning in your teaching. There are notes as to how to use the strategy in your teaching and how this may be beneficial to your students as they take up new content or language.

Also here is a link to the UOW site: Inclusive Teaching in Higher Education, UOW (https://intranet.uow.edu.au/socialinclusion/inclusiveteaching/morepracticalstrategies/design/index.html). This site is divided into practical strategies that are organised in the Transition pedagogy framework as identified by the Australian Learning and Teaching Council Senior Fellow Professor, Sally Kift. More on this work can be found at http://www.fyhe.qut.edu.au/transitionpedagogy/

Table: The strategy table is divided into two columns. Strategies are outlined in the left-hand column. The 'Value adding' column is explains how or why this strategy may useful in your teaching. For example: providing the teacher with feedback on student understanding of the topic; aiding student uptake of new language or assisting students with their writing skills; how this strategy can incorporate new technologies; etc.

Strategies for individual students

These strategies can be used in class without interrupting the flow of the lesson therefore they can be easily used with large groups or to end a teaching session. Many of these are also easy to implement through online discussion forums.

Strategy	Value adding
One Minute Paper Pose a question (either specific or open-ended), and give students one or perhaps two minute(s) to respond in writing. *Example*: 'What was the main point of today's class material?' OR 'How is the theory presented today similar to or different from the theory presented in the last class?'	A highly effective technique for checking student progress, both in understanding the material and in reacting to course material.
Muddiest (or Clearest) Point At the end of a class, or at a natural break in the presentation, ask 'What was the "muddiest point" in today's lecture?' or, perhaps, you might be more specific, asking, for example: 'What (if anything) do you find unclear about the concept of 'personal identity' ('inertia', 'natural selection', etc.)?'.	This presents a clear source of feedback on teaching, identifying student understanding.
Fish Bowl At the end of a lesson, students are asked to write down one clarification question concerning the lesson material. Students then deposit their questions in a bowl. The instructor draws several questions out of the bowl and answers them for the class or asks the class to answer them.	As above. Online: students can post on a discussion forum for your/peer comments.
Response to a demonstration or other teacher-centred activity The students are asked to write a paragraph that begins with: 'I was surprised that ...' 'I learned that ...' 'I wonder about ...' allowing students to reflect on what they gained from the presentation. It helps students realize that the activity was designed for more than just entertainment.	An excellent method of gaining feedback. Also useful to see how students are taking up new information.

Strategy	Value adding
Affective Response Students are asked to report their reactions to some facet of the course material, eg. an emotional or evaluative response to the material. *Example*: It is a good way to begin a discussion of evolutionary theory or any other scientific area where the general public often has views contrary to current scientific thinking, such as paper vs. plastic packaging or nuclear power generation.	A technique that builds links between students' knowledgebase/experience & new material presented. Nb. This technique is limited to disciplines where such an approach is appropriate, eg. ethics, or as a precursor to theoretical analysis.
Reading Quiz Provide questions related to the week's assigned reading/s and time for students to write their answers. Nb: The type of question asked will point to the kind of information valued. 'When did this theorist live?' – indicates that it is the details that count, 'What were the contributing factors that led to X's research?' - highlight issues of context or justification. If your goal is to instruct (and not merely to coerce), carefully choose questions which will both identify who has read the material (for your sake) and identify what is important in the reading (for their sake). *For further information about question asking see Questions & Answers.*	The reading quiz can be used as an effective measure of student comprehension. Also, by asking the same sorts of questions on several reading quizzes, you will give students guidance as to what to look for when reading an assigned text.
Quotations After students have learned about several opposing theories or schools of thought, provide a quotation by an author they have not read in the assigned materials, and ask them to figure out the position that theorist advocates.	A particularly useful method to test student understanding. In addition to testing comprehension of the material presented, this exercise develops critical thinking and analysis skills.
Finger Signals Students signal their answers to closed or multiple choice questions by indicating with their fingers, immediately in front of their torsos. *Example*: 'One finger for 'yes', two for 'no''. In large classes students can raise their hands for their chosen answer. Student knowledge can be assessed literally at a glance.	A quick method of gaining immediate feedback on student understanding of material presented. With large groups Clickers can be used.
Self-assessment Ask students to bring a draft assessment task to class and provide questions to consider. (Alternate activity: ask students to respond in writing to a question posed in class. Then assess their own work.) *Example questions for a written assessment task (eg. essay, report):* What is the main point that I am arguing? How have I constructed the argument? Does each paragraph have a topic sentence? Is each supported by research/literature? What are the areas that I've done well? Why? Where can I improve? How?	This activity builds skills vital both in the learning context as well as later in a professional role. It is important to prepare students for this task by providing an example for the whole class to work through beforehand. This is also an activity that is easy to use in online teaching contexts.

Strategy	Value adding
Critical Thinking Motivators Sometimes it is helpful to get students involved in discussion of or thinking about subject material either *before* any theory is presented in lecture or after several conflicting theories have been presented. The idea in the first case is to generate data or questions prior to mapping out the theoretical landscape; in the second case, the students learn to assess the relative merits of several approaches.	
Intuition Quiz Asks student to identify and assess their own views before new material is presented in class. After students have responded to the questions individually, they can discuss/debate in pairs or small groups. *Example*: A true/false quiz before learning moral theory – statements could include 'there are no correct answers to moral questions'. *For further information about question asking see Questions & Answers.*	This technique assists students to see the relevance of engaging with new material. Can combine an individual task with group activities.
Puzzles/Paradoxes A puzzle or paradox is presented to students, who work in groups to understand how this can be. Students can work individually or in groups and can then present their explanation. *Examples:* *Philosophy* - students can assess the infamous "Liar Paradox" (with instances such as 'This sentence is false'), and suggest ways in which such paradoxes can be avoided. *Science* - present experimental data which seems to contradict parts of the theory previously presented or use examples which seem to have features which support two opposing theories.	Useful in hearing student understanding of a topic. By asking students to "work it out" without a solution offered, you open up opportunities to critically assess later content.
Summary points At the end of a teaching period (lecture or tutorial) students are asked to summarise the main points raised. The teacher can then call for these and prompt students in areas that are less clear.	New vocabulary is used and discussed. Students have practice with forming links between new ideas raised and past class material.

Strategies for paired students

Pairing students has many advantages of group work. Students have the opportunity to state their own views, hear from others, hone their skills for debate, without the time costs associated with group work. Pairing students also increases student accountability, with every student having the opportunity to participate. Finally, pairing students can take place in any learning context (lecture, tutorial or lab).

Strategy	Value adding
Discussion Students are presented with a question to respond to and pair with their neighbour. Generally this works best when students are given explicit directions. – 'Turn to your neighbour and answer this question. Make reference to the theory/experimental data that has been our topic today' *For further information see: Think, Pair, Share in Cooperative Learning Exercises section.*	A highly effective technique, giving students time to consider and trial new vocabulary, ideas or content.
Student Peer Evaluation	This one activity can improve

This activity requires some preparation by providing samples of student writing for the class to assess so that each student can gain the necessary skills to give feedback to their peers. Students bring to class a draft (or portion) of the upcoming assessment. Then in small groups the students can read and give critical feedback to their peers. This is a particularly effective way to improve student writing. *For a more detailed outline:* https://teaching.unsw.edu.au/printpdf/544	student writing and self-assessment skills in the short and longer term. It also develops critical thinking skills and understanding of the art of feedback delivery. This can also be conducted online (see link).

Cooperative Learning Exercises

For more complex projects, you may want to have students work in teams of three or more. Students working together can help each other to learn. Cooperative groups encourage discussion of problem-solving techniques and encourage sharing of expertise between members.

It is vital to remember that students need to have instruction on how to work cooperatively in teams, it does not come naturally. A short explanation followed by one or more formative tasks, where students can attempt new skills, will enhance student efficacy and team efficiency – this is necessary before setting summative assessment tasks designed around team work.

Strategy	**Value adding**
Think, Pair, Share When posing a question in class, ask students to take time to consider their answer before responding (they can make notes). Then ask students to discuss their answer with one other student. Each student takes a turn. Finally, the pairs can join into groups of four for further discussion or the class can discuss this as a whole. The strategy can be used in any configuration 1-2-4-class; 1-2; 1-2-class and can be used in small or large groups.	This strategy promotes and supports higher level thinking. It supports language development and gives opportunities for students to trial new vocabulary and concepts. Also this allows students a safe/easy way to enter a discussion and build on others ideas.
Buzz Groups Pose a question to be worked on in groups, then circulate around the room monitoring discussion progress by answering questions, asking further questions, and keeping the groups on task. Students can then report their discussion points to the whole class. *See Question & Answer section for further information on asking questions.*	This is similar to the strategy above. Nb. Group or team members can be assigned roles, for further information: http://www.uq.edu.au/student-services/learning/roles-groups
Active Review Sessions In a traditional topic review session students ask questions for the teacher to answer. Students note the answers rather than engaging in deeper thinking about the material. An active review session involves the questions being posed for the students to work on in groups. The students then present their solutions to the class and discuss any differences among solutions proposed.	This strategy engages students in higher order thinking and allows more interaction with the answers. Peer feedback can also be used to sharpen presented solutions.
Work at the 'Blackboard' Instead of the lecturer/tutor solving problems (logic, mathematical, critical thinking) on the 'board' (blackboard, whiteboard, COW, etc.), this strategy engages students in problem solving and sharing their responses. Students work together on the 'board' provided and problem solving strategies are shared with the class. This can also be done on giant Postits or butchers' paper (depending on resource availability).	This strategy provides extended opportunities for students to engage in higher order problem solving as well as opportunities for peer feedback. It also utilises many forms of technologies, though is not technology dependent.

Strategy	Value adding
Concept or Mind Mapping A concept map is a way of illustrating the connections that exist between terms or concepts covered in course material. Students map connecting terms or ideas on a 'page' by lines which indicate the relationship between each set of connected terms. Most of the terms in a concept map develop multiple connections. A helpful clip on creating a mind map: https://www.youtube.com/watch?v=tAUsZ9eiorY Note: There are many online mind map tools currently available.	Developing a concept map requires students to identify and organize information and to establish meaningful relationships between pieces of information. Use of colour and symbols to show further relationships is also helpful.
Visual Lists Students work together on making lists in order to answer a given question eg. comparing the pros and cons of a theory (or nuclear power); or finding similarities or differences between two things (theories; pieces of legislation).	This activity can be conducted on paper, using technologies available or on a board for all to see. It is a helpful exercise for teachers to gauge students' understanding of a topic.
Jigsaw Group Projects **Divide**: Divide students into small groups (with equal number in each, say 4 or 5). Assign a topic for discussion and divide the material to be researched into 4 or 5. **Experts**: Each member of the group is then assigned one part of the topic. They read only about their part. Then the groups are re-arranged so that the 'experts' all gather to discuss that one part of the topic. Allow time for students to plan how they will teach their expertise to their respective groups. **Share**: Groups return to their original configuration which now contains experts on each of the 4 or 5 parts of the topic. They each present their part to the group, sharing their expertise.	This exercise extends students' confidence in the content they are learning by having them teach each other. Where students have to lead in this way they are necessarily deeply engaged in their learning. There are also benefits for language acquisition as **all** students have to learn and use language pertinent to the topic.
Debates Students are assigned debating teams, given a position to defend, and then asked to present arguments in support of their position. The opposing team should be given an opportunity to rebut the argument(s) and, time permitting, the original presenters asked to respond to the rebuttal.	This format is particularly useful in teaching skills for developing an argument (in addition to teaching content).
Role Playing Students are asked to 'act out' a part in a scenario, giving further insights into concepts/theories in subject content. Eg. Teacher/parent interview for preservice teachers; preparing defence/ prosecution cases in mock court case (law); considering points in history – eg. preparing defence for Socrates trial using historic sources.	This strategy enhances students' critical thinking skills; develops co-operative/ team building skills; and enriches students' language development.
Panel Discussions Student groups are assigned a topic to research and asked to prepare presentations (note that this may readily be combined with the jigsaw method outlined above). Each panelist is then expected to make a very short presentation, before the floor is opened to class questions. Keys to success: Select topics carefully and to give students sufficient direction. Class preparation: have other groups pre-prepare questions or take on roles related to the topic (eg. environmentalists; economists etc.).	Both the presenting of material and the questioning requires critical thinking and interaction with the content and with class members.
Games Games can be commercially available or depend on teacher creativity but the central idea is that the tasks must be fun, engaging and directly and clearly	Well-constructed and game playing carefully linked to subject content can aid student engagement, understanding and uptake of new

Strategy	Value adding
related to the current topic.	information. The interaction between students and with texts can also aid language uptake. Games can be conducted online or in face to face contexts allowing all students to participate.

Questions and Answers

While most of us use questions as a way of prodding students and instantly testing comprehension, there are simple ways of tweaking our questioning techniques which increase student involvement and comprehension. Questioning encourages active learning through challenging students. Our questions must be experienced as respectful rather than threatening thereby opening up discussion.

Nb. *This section is taken from: Layton, C (nd) Teaching Strategies for Tutors: A simple guide to dealing with students and running tutorials. Academic Development Unit, University of Wollongong.*

1. Open & Closed Questions

A **closed question** (or factual question) requires a yes/no response or converges on a specific answer. It leaves control and direction with the teacher. Examples of closed questions are:

What is the name of…?
Is it…?
Is this statement … ?
Who developed… ?

Closed questions are useful in establishing and activating prior learning at the beginning of a tutorial and may be useful in warming up students prior to more complex open questions.

An **open question** (also known as a divergent question) allows scope for exploration as a range of answers would be perfectly acceptable. Examples of open questions are:

What ideas might help us think about … ?
What ways … ?
What sorts of things affect … ?
What do you know about … ?
How did you come this view?

One advantage of asking more open questions is that the responses give you the opportunity to learn what students are thinking/feeling about a subject; another is that you can more easily identify misconceptions. In both cases, this allows you to adjust your teaching to better meet learning needs.

2. Different Types of Questions

It's good practice to vary the kinds of questions. Here we offer examples of different types of questioning and range from questions requiring simple answers to those requiring critical and higher order thinking.

a. ***Factual or exploratory questions*** probe facts and basic knowledge and allow little opportunity for dissent:

   'What does x equal in this equation?'

b. ***Challenge questions*** examine assumptions, conclusions and interpretations:

'How else might we account for the findings of this experiment?'

c. ***Diagnostic questions*** probe motives or causes:

'Why does new housing remain empty after the Indian Ocean tsunami?'

d. ***Action questions*** call for a conclusion or actions:

'In response to the feedback you have received on your project, what should you do?'

e. ***Extension questions*** expand the discussion:

'How does this comment relate to what we have previously discussed?'

f. **Hypothetical questions** pose a change in the facts or issues:

'Suppose the invention of the kerosene lamp by an Arab scholar in the 9th century had spread to the West at that time. How might this have changed everyday life?'

g. ***Comparative and speculative questions*** Bateson (1972) argues that the news of difference creates the difference. This suggests we should create processes that involve comparison, so the ordinary can be experienced as extra-ordinary. Some examples of these types of questions are:

'If we were to integrate good questions into all aspects of our tutorials, what would we be doing? What differences might our students notice?'

'If our learning in this subject turned out to be really productive and useful, what would be happening? What differences would we notice? What differences might those we work with notice?'

h. ***Priority or evaluative questions*** seek to identify the most important issue or make a judgement on the relative value of two points being compared:

'Which should we be more concerned about - safety & welfare of the public, or the environment?'

i. ***Summary questions*** elicit syntheses:

'What themes or issues have emerged from today's discussion?'

3. Different Levels of Questions

Questions can be asked at a number of levels and suitable for different stages of learning. Bloom's (1956) hierarchy of cognitive skills can be used to formulate different levels of questions.

Knowledge: recalling information, definitions, concepts, principles, and formulas: 'What is the formula for…?'

Comprehension: reformulating or explaining existing knowledge: 'What does … mean?' 'Give an example of …'.

Application: using information in a new context to solve a problem or answer a question: 'How would you graph data in a sample like this one?'

Analysis: analysing assumptions, reasons or problem-solving: 'How does this fit together?' 'What factors have contributed?'

Synthesis: creating new ideas, concepts or plans: 'How might we relate… in order to design…?'

Evaluation: making judgements on the basis of evidence, criteria etc.:

'How successful might this design be in meeting community needs?'

Strategy
***Ask one question at a time*.** In an effort to encourage responses teachers sometimes attempt to clarify a question by rephrasing it. A better strategy is to ask a brief, focused question and wait for a response.
After you ask a question, pause and allow plenty of time for students to think about their answer. Avoid the temptation to jump in and answer even if the silence feels uncomfortable. Students may need 10-30 seconds to form an answer to a question. Waiting indicates that you want thoughtful participation. It may be useful to tell students that they are going to have plenty of time to think about their responses. Waiting increases the complexity of the answer, the number of unsolicited responses and the number of questions asked by students. Waiting decreases the number of students who fail to respond when called upon. If the silence exceeds about 30 seconds you can ask prompting questions.
Where possible ask questions that invite multiple answers.
Ask questions that require students to demonstrate their understanding Instead of 'Does everyone understand how I got this answer?' Ask, 'Why do you think I substituted the value of delta in this equation?'
Structure your questions to encourage student-to-student interaction. Students become more attentive when you ask questions that require them to respond to each other.
***Good questioning is as much about listening as it is about speaking*.** Listen carefully to what the student is saying. Do not interrupt, even if a student is heading towards an incorrect answer. Interrupting does not create an atmosphere that encourages participation. Ask the student for clarification if you do not understand. Show that you are listening by maintaining eye contact and nodding.
Acknowledge all responses whether you consider them to be useful or completely missing the point. It may be preferable to say 'You're not quite there yet/have you considered…/ don't forget… rather than 'No, that's wrong. Think again'
Student Summary of Another Student's Answer In order to promote active listening, after one student has volunteered an answer to your question, ask another student to summarize the first student's response. Many students hear little of what their classmates have to say, waiting instead for the instructor to either correct or repeat the answer. Having students summarize or repeat each others' contributions to the course both fosters active participation by all students and promotes the idea that learning is a shared enterprise. Given the possibility of being asked to repeat a classmates' comments, most students will listen more attentively to each other.
Quiz/Test Questions Here students are asked to become actively involved in creating quizzes and tests by constructing some (or all) of the questions for the exams. This exercise may be assigned for homework and itself evaluated (perhaps for extra credit points). In asking students to think up exam questions, we encourage them to think more deeply about the course material and to explore major themes, comparison of views presented, applications, and other higher-order thinking skills. Once suggested questions are collected, the instructor may use them as the basis of review sessions, and/or to model the most effective questions. Further, you may ask students to discuss the merits of a sample of questions submitted; in discussing questions, they will significantly increase their engagement of the material to supply answers. Students might be asked to discuss several aspects of two different questions on the same material including degree of difficulty, effectiveness in assessing their learning, proper scope of questions, etc.

In preparing this resource I have drawn heavily on:

1. Active Learning Classrooms, University of Minnesota
   http://cei.umn.edu/support-services/tutorials/active-learning-classrooms
   This website offers a tutorial and resources for incorporating activity into your classroom as well as offering strategies for classroom management.

2. Center for Teaching and Learning, Stanford University, Stanford CA
   http://web.stanford.edu/dept/CTL/handouts/PDF/get_students_talking.pdff

3. Active Learning For The College Classroom
   http://web.calstatela.edu/dept/chem/chem2/Active/index.htmm

4. Integrating language-focused activities in tertiary classrooms, RMIT

5. Zhang, F., Lidbury, B. A., Richardson, A. M., Yates, B. F., Gardiner, M. G., Bridgeman, A. J., Schulte, J., Rodger, J. C., & Mate, K. E. (2012*). Sustainable Language Support Practices in Science Education: Technologies and Solutions* (pp. 1-266). doi:10.4018/978-1-61350-062-0

6. Layton, C (nd) Teaching Strategies for Tutors: A simple guide to dealing with students and running tutorials. Academic Development Unit, University of Wollongong.

Dr Kathryn Harden-Thew, 2015